



Liberal versus conservative public policies on crime: What was the comparative track record during the 1990s?

Ling Ren^{a,*}, Jihong Zhao^a, Nicholas P. Lovrich^b

^a College of Criminal Justice, Sam Houston State University, Huntsville, TX 77341

^b Division of Governmental Studies and Services, Washington State University, Pullman, WA 99164

ARTICLE INFO

ABSTRACT

The purpose of this study was to examine the efficacy of social control and social support policies associated with conservative and liberal political ideologies with respect to violent crime in large U.S. cities during the 1990s. Eighty-five cities with populations of 150,000+ were included in the analysis; these cities accounted for fifty-two million urban area residents of the U.S. The use of the *two-way, fixed-effect panel data method* of statistical analysis enabled the authors to assess the relationship between change in local government expenditures for police and court services (social control) and expenditures on community development and park/recreation (support policy) and corresponding changes in crime rates documented within these cities. The findings indicated that expenditure on **both** police services and community development initiatives had significantly suppressive effects on crime in these cities during the period of the 1990s. It appeared that both conservative and liberal policies had their merits as effective countermeasures to crime.

© 2008 Elsevier Ltd. All rights reserved.

Introduction

A defining feature of American democracy is the presence of open political debate on significant governmental policies. Consequently, virtually no major public policy remains immune from challenge or criticism. For the most part major public policies face noteworthy criticism prior to, during, and after their ultimate implementation. In this regard, one of the most controversial and hotly debated public policies since the turbulent 1960s has concerned the proper approach to be adopted to control violent crime in large U.S. cities.

From the 1960s to the early 1990s, American society experienced a substantial increase in urban crime, particularly violent crime. This increase in crime affected nearly every metropolitan area in the country. Not surprisingly, the dramatic and prolonged increase in violent street crimes in the nation's cities raised grave concerns among public officials and considerable fear among the general public, particularly during the 1970s and 1980s (e.g., Wilson, 1975). A central public policy question for this period was rather straightforward: how can the problem of crime be best addressed? Predictably, the two principal opposing political camps offered their respective ideological views on crime control policies in the U.S. The advocates of a liberal political ideology stressed the importance of building strong social support mechanisms to prevent crime, while the advocates of a conservative political ideology issued broad appeals for more extensive deployment of agents and mechanisms of social control to

apprehend offenders and deter potential criminals from engaging in crime.

Advocates of the conservative point of view frequently accused their liberal counterparts of abject policy failure in controlling American crime. For example, James Q. Wilson (1975) publicly proclaimed “the bankruptcy” of liberal social support policies implemented in the period of the 1960s and early 1970s. Ten years later, Currie (1985, p. 10) fought back and asserted the following: “It is painfully apparent that the decade-long conservative experiment in crime control has failed to live up to its promises.” Though liberal and conservative anti-crime initiatives were certainly not mutually exclusive, even a cursory acquaintance with the history of crime policy in the U.S. instructed that the pendulum often moved pretty far to one side or the other for substantial periods of time.

During the 1990s, the three-decade long period of the upward trend of crime in the U.S. changed rather dramatically. The crime rate during this decade was initially on the rise, then leveled off, and then dropped significantly after 1994. This pattern of aggregate change across U.S. cities offered a good opportunity to examine empirically the respective impacts of crime reduction policies proposed by the proponents of liberal and conservative approaches to public safety.

The purpose of this study was to examine the relative efficacy of municipal enhancements in social control and social support policies—associated with the conservative and liberal ideologies, respectively—on violent crime in U.S. cities during the 1990s. It was clear that reports of violent crime, particularly street crime, had a significant effect on public fear of crime (Wilson, 1975), prompting politicians to want to demonstrate to their voters that they were tough on “crime” (Scheingold, 1984). The act of “cracking down” on crime had the effect

* Corresponding author. Tel.: +1 936 294 4793; fax: +1 936 294 1653.
E-mail address: Lren@shsu.edu (L. Ren).

as well of intensifying the public policy debate between liberals and the conservatives, both nationally and at the local level (Walker, 1985). What light can be shed on this debate by a review of municipal crime rates in major U.S. cities over the period of the 1990s? Cities with population of 150,000+ were included in the analysis reported here; these cities accounted for fifty-two million U.S. residents. The use of the two-way, fixed-effect panel data method enables the authors to assess the relationship between changes in government expenditures for social control and for social support and corresponding change in crime rates in these U.S. cities over the course of the 1990s.

Theoretical considerations

The conservative ideology and the liberal ideology clearly represented two opposite endpoints on a conceptual continuum (Rosch, 1985; Scheingold, 1984; Walker, 1985). Both political ideologies were associated with specific propositions on the causes of crime and the proper means by which to cure the perceived “epidemic” of crime in American society. In this study, ideology was defined as “a set of general and abstract beliefs or assumptions about the correct or proper state of things, particularly with respect to the moral order and political arrangements, which serve to shape one’s positions on specific issues” (Miller, 1973, p. 20). Reference to the debate between the two opposing ideologies can be found in virtually every major policy book published in the field of criminal justice in the 1980s (e.g., Duffee, 1980; Scheingold, 1984; Walker, 1985).

Conservative political ideology and social control policy

The focus of the conservative political ideology was upon the individual, reflecting the belief that criminals differed from ordinary citizens because they “suffer from some basic character defect...” (Scheingold, 1984, p. 135). The defect in question was best represented by the image of a person lacking in moral character, and this personal shortcoming led to a tendency to become involved in the commission of crimes. This moral deficit was the primary root cause of crime for conservative thinkers (Wilson, 1975).

The advocates of the conservative political ideology generally viewed humans as highly calculative beings. Over the past forty years since Gary Becker’s (1968) study, there has been a surge of activity in trying to understand the economics of crime. Becker (1968) argued that the increased cost of crime such as more or longer sentences led to less of it. Crime reduction occurred through the mechanism of deterrence. In line with the perceptions of the classical school of economics, the belief was that individual decisions of an action were made on the basis of the weighing and balancing at potential gains and likely possible losses in terms of one’s ultimate personal utility. If an individual believed that the gain was likely to be more than the likely cost, a “rational” action would take place (Gibbons & Garabedian, 1974; Van den Haag, 1975). A criminal lacking in moral character would commit a crime if he/she believes that the gain (usually economic reward) was greater than the cost (typically getting caught by the police and receiving a prison sentence). From the foregoing it followed that an effective way to control crime was to increase the cost of crime so that potential criminals (those with moral deficits) could be deterred—or at least think twice before committing a crime. Along these lines, Van den Haag (1982) argued for an increase in the severity of punishment in order to raise the cost of crime to a level sufficient to deter potential criminals.

For the conservatives, individuals tended to commit crimes principally under two primary conditions. First, they suffered a deficit in moral character that resulted in inadequate internalization of the commonly accepted norms of civil society. Second, the calculation they made of potential gains or losses told them that committing a crime represented a worthwhile risk because the potential gain was likely to be greater than the potential cost.

For the conservatives, the answer to the problem of rampant urban crime was also relatively simple: the need to “get tough” on criminals along the lines of Packer’s (1968) crime control model featuring aggressive law enforcement and stiff penalties imposed by prosecutors and the courts. The key underlying conceptualization of the “getting tough” policy was the enhancement of social control carried out by government agencies. Social control could be enhanced in families, in schools, and in the three core components of the criminal justice system—the police, the courts, and the corrections system (Packer, 1968).

Police commonly represented the centerpiece of this “get tough” policy because they were the *gatekeepers* of the criminal justice system and they were responsible for getting criminals, particularly violent offenders, off the streets (Wilson, 1975). In addition to the “incapacitation” of criminals by their prompt arrest and incarceration, an increase in the physical presence of police had a deterrent effect on potential criminals; therefore the potential cost of committing a crime was increased in direct proportion to police presence and visibility (Van den Haag, 1975). The conservative ideology was also sympathetic to the idea that the enhancement of the court system was good public policy because criminals arrested by the police needed to be processed through the system quickly to achieve the deterrence effect noted above (Packer, 1968). Finally, the conservative policy called for enhanced jail and prison space because an effective way to deal with criminals was to separate them from the innocent citizens, and keep them in custody for substantial periods (Dilulio, 1991). In this regard, Wilson (1975, p. 260) noted the following: “Wicked people exist. Nothing avails except to set them apart from the innocent people.” The advocates of the conservative ideology tended to hold scant hope for the possibility that offenders could be rehabilitated through progressive corrections programs, preferring instead that sentences be long and that the overall conditions of incarceration be rather harsh. This study focused on two essential components of social control policies proposed by the conservative ideology—namely, the role of the police and of the court system in active crime control.

One of the most persistent policy goals of conservative scholars in criminal justice and conservative politicians alike was the achievement of enhanced funding for law enforcement (Gest, 2001; Wilson, 1975). It was a reasonable expectation that additional police officers were able to arrest more offenders and put more criminals behind bars. While some studies have documented the crime-suppressive effects of enhanced police resources (e.g., Eck & Maguire, 2000; Howsen & Jarrell, 1987; Land & Felson, 1976; Swimmer, 1974), others have reported contrary evidence regarding this relationship (e.g., Greenberg & Kessler, 1982; Pogue, 1975; Wellford, 1974).

In the review of the available literature, this article closely examines several studies conducted in the period of the authors’ interest (the 1990s) that relied upon relatively advanced statistical analytical methods (pooled time-series analysis). These studies suggested rather clearly that additional police expenditure and additional law enforcement employees did tend to lead to a reduction in crime, particularly violent crime; this seemed to be the case at both the national and the city level. For example, Marvell and Moody (1996), using a “Granger-causality” statistical approach on panel data for U.S. states and large U.S. cities, demonstrated that annual increases in the number of police were directly associated with reductions in crime in future years. They estimated the elasticity of total index crime (violent and property crime combined) with respect to the number of police of approximately -0.30. In another two-stage panel data analysis of city crime rates, Levitt (1997) used the timing of mayoral and gubernatorial elections as an instrumental variable and examined the relationship between police hiring and crime rates in fifty-nine large cities for the period 1970 to 1992; Levitt found elasticity estimates ranged between -0.05 and -1.98 across time categories, with a median value of -0.79. In a follow-up study, Levitt (2002) found more precisely estimated elasticities of -0.43 to -0.50, using more current data.

Moreover, in his recently published article “*Understanding why crime fell in the 1990s*,” Levitt (2004) identified four factors that explained the crime drop during the 1990s and six that did not. The increase in the number of police was highlighted as one of the four that could account for virtually all of the observed decline in crime during the 1990s.

Similarly, using panel data for over 5,500 cities representing 133 million U.S. citizens, Zhao, Scheider, and Thurman (2002) found that additional federal funding to local law enforcement agencies had a significant effect on violent crime reduction for cities with populations 10,000+ in the period 1994 to 1999. A similar study conducted by the General Accounting Office (2005) confirmed that the receipt of federal grant funding through the Office of Community Oriented Policing Services (COPS) in the 1990s period led to a significant reduction in local crime rates. In a review of the evidence regarding the causes of a dramatic reduction of crime witnessed in recent years, Hoover (2005) observed that the reduction in crime was in some measure the result of a wise federal investment in the enhancement of local police resources.

Liberal political ideology and social support policy

It was fair to say that one fundamental difference between the liberal and conservative political ideologies centered on the root cause of crime (Walker, 1985). Liberals tended to believe that an unfavorable social environment (nonlegal) bred crime; social conditions such as social inequality and racial discrimination were believed to be among the primary generators of criminal behavior (Currie, 1985). Inequality can be seen to represent the failure of society to provide a sufficient range of legitimate means of achieving culturally defined goals (Blau & Blau, 1982). By this logic, individuals who engaged in crime should not be held fully accountable for their criminal behavior given these adverse societal conditions. After arguing that more police resources and enhanced court system might not reduce crime, Ohlin (1971, p. 36) summarized the liberal view on the root causes of crime well in the following observation: “Crackdown works in the short run. But in the long run the only hope for curtailing the various forms of individual and collective violence...is to develop a system of open opportunities that will give each citizen a chance to stake out a claim to a successful, and law-abiding way of life.”

Liberals generally tended to see crime as a function of failed social arrangements (Clark, 1970; Rosch, 1985). The widely read report of the Kerner Commission (1968) issued at the height of the U.S. crime wave identified the existence of two separate and unequal communities in American cities and the prevalence of poverty and lack of infrastructure as among the most important reasons for the existence of high crime rates in large U.S. cities. The “war on poverty” marked the first systematic federal effort to change the basic infrastructure of poor communities across the nation. The liberal framing of the crime issue as a *social equity* problem rather than one of insufficient *social control* summarized the great difference of beliefs as to fundamental causes of crime separating liberals and conservatives.

In addition to promoting social equity in economic terms, liberals also advocated substantial change in the landscape of the criminal justice system. Since the progressive movement at the turn of the twentieth century, liberal reformers have sought to improve the criminal justice system by instituting due process and fairness procedures to be followed by the police, the courts, and corrections facilities dealing with criminal defendants (Packer, 1968; Rosch, 1985). Liberal scholars were apt to point out that while America was the most punitive state among the developed countries, it nonetheless remained one of the most violent countries in the industrialized world community (Currie, 1985). From the liberal perspective, conservative policies favoring the enhancement of the capacities for social control of the criminal justice system were doomed to failure so long as the underlying social inequalities remained unaddressed and unfair criminal justice system operations persisted.

The key to liberal propositions regarding crime control was the concept of *social support* in contrast to the conservative's social control focus. In this regard, Cullen (1994) argued that there was a direct and inverse relationship between the level of social support that an individual received and their likelihood to engage in criminal conduct (also see Lin, 1986). Cullen (1994) viewed the ability of a community to provide social networks that provided both instrumental and expressive support and resources to local residents to be a critical asset for the maintenance of public safety. A number of studies have indicated that communities in which social support was high usually experience low crime rates (e.g., Cao, Cao, & Zhao, 2004; Sampson & Groves, 1989; Sampson, Raudenbush, & Earls, 1997; Skogan, 1990; Smith & Jarjoura, 1989).

More recently, Pratt and Godsey (2003) examined the association between level of social support and homicide rate in forty-six nations using data derived from health statistics published by the United Nations and the World Health Organization in 2000. Social support was measured by the percentage of a nation's gross domestic product (GDP) spent on health care. After controlling for a variety of demographic variables, their multivariate analysis indicated that social support had both a direct and indirect (with inequality) effect on homicide rate among these nations.

The foregoing review of conservative and liberal ideologies in criminal justice revealed that these two perspectives indeed lay on a single continuum, with conservatives calling for more social control and deterrence on one end and liberals arguing for generating more social support and reducing inequality on the other end. In spite of the ubiquity of these two ideological perspectives in the field, there has been little if any empirical study examining the comparative track records of conservative and liberal public policy prescriptions during the 1990s, a period in which U.S. crime rates fell for the first time in over thirty-five years.

Research methods

Data

The data used in this analysis were derived from four principal sources. The first source was the Uniform Crime Reports (UCR) published annually by the Federal Bureau of Investigation (FBI). UCR data reflected a nationwide effort to collect criminal activity data from approximately 17,000 state, county, and municipal law enforcement agencies voluntarily reporting crimes that had been brought to their attention. About 85 percent of law enforcement agencies reported their annual crime data to the FBI. These data on “crimes known to police” contained in the UCR data base for the period 1991 to 2001 were downloaded from the ICPSR Web site maintained at the University of Michigan, a data collection warehouse which stored many such data bases for the benefit of independent researchers and university-based scholars.

A second type of data was obtained through the Annual Finance Survey of City Government conducted by the U.S. Census Bureau. The survey of local government finance officials asked questions concerning a wide variety of financial situations in a city government with respect to revenues, expenditures, debts incurred, and assets (cash, capital possessions, and security holdings). A unique feature of this annual financial survey was that all cities were required to complete the survey and submit it to the U.S. Census Bureau annually. This data set represented the total population of all large cities in the U.S. In this study, financial information for each city for the period 1990 to 2000 was downloaded from the <http://www.census.gov/govs/> Web site. The third type of data gathered was the city annual unemployment rate data for the period 1990 to 2000; these data were obtained from the Bureau of Labor Statistics. Finally, standard demographic information on individuals and households at the city level was also included from the 1990 and 2000 U.S. Census reports. The 1990 and 2000 data were

derived directly from the DVD disks published by the U.S. Bureau of Census.

Variables included in the analysis

Dependent variable

The dependent variable employed in the analysis was derived from UCR data for violent crimes per 100,000 population. Consistent with the UCR format, the violent crime rate reflected the sum of the incidences of four specific crimes against persons (murder, rape, robbery, and aggravated assault) divided by each city's population and multiplied by 100,000. The authors selected this variable because violent crimes were the most salient type of crimes with respect to media coverage and public discussion, and they served as the centerpiece of the policy propositions for both liberal and conservative advocates in criminal justice and in the marketplace of political ideas and election campaign debates (Currie, 1985; Walker, 1985; Wilson, 1975).

Independent variables

Four separate and distinct independent variables were used in the testing of hypotheses relating to the competing propositions of the conservatives and liberals. Based on the financial reports gathered in the Annual Finance Survey of City Government, four per capita expenditure measures were developed for each city. The two variables designed to tap into the conservative social control-oriented countermeasures to crime were: (1) the annual police expenditure per resident, and (2) the annual court expenditure per resident. Police expenditure was defined as "expenditure on police preservation of law and order, protection of persons and property from illegal acts, and the prevention, control, investigation, and reduction of crime" (U.S. Census Bureau, 2000). Similarly, court expenditure was defined as "expenditure on courts (criminal and civil) and activities associated with courts, legal services, and legal counseling of indigent or other needy persons" (U.S. Census Bureau, 2000). The review of the literature indicated that the key policy proposition of the conservative was to expand the criminal justice system for the reason of "getting tough" and enhancing social control (e.g., Gest, 2001; Wilson, 1975). Two hypotheses were derived based on the conservative preference for enhancing social controls as an approach to combating crime:

Hypothesis 1. An increase in annual police expenditures will have a suppressive effect on a city's violent crime rate.

Hypothesis 2. An increase in the annual court expenditures will have a suppressive effect on a city's violent crime rate.

Similarly, two variables were derived from the same principal source to test two corresponding propositions regarding the benefits of social supports: (1) the annual expenditure per resident on community development, and (2) the annual expenditure per resident on park and recreational facilities in the community. Community development spending was defined as "construction, operation, and support of housing and redevelopment projects and other activities to promote or aid public and private housing and community development" (U.S. Census Bureau, 2000). For example, this category of city expenditures included urban renewal and slum clearance, redevelopment and rehabilitation of substandard or deteriorated facilities and areas, and revitalization of commercial areas in a community. Park and recreation spending was defined as "provision and support of recreational and cultural-scientific facilities maintained for the benefit of residents and visitors" (U.S. Census Bureau, 2000). The specific examples of park and recreation expenditures included playgrounds, tennis courts, public beaches, swimming pools, playfields, parks, camping areas, recreational piers and marinas, etc., including support of private facilities; galleries, museums, zoos, and botanical gardens; auditoriums, stadiums, recreational centers, convention centers, and

exhibition halls; community music, drama, and celebrations including public support of cultural activities.

In contrast to the conservative's social control emphasis, liberals tended to call for improving the infrastructure of a community and enhancing the social support mechanisms present within the community (e.g., Currie, 1985; Walker, 1985). In addition, liberals proposed to change the societal environment of a community to make social life as harmonious as possible and as supportive on social equity norms as possible. Two parallel hypotheses were derived for testing from liberal anti-crime propositions:

Hypothesis 3. An increase in annual expenditures on community development will have a suppressive effect on the violent crime rate in a city.

Hypothesis 4. An increase in annual expenditures on parks and recreational facilities will have a suppressive effect on the violent crime rate in a city.

The reported annual expenditure on each category was the total of funding allocated in that area by the city from federal, state, and city government services. In order to account for inflation, each annual expenditure variable was adjusted by the annual consumer price index (CPI) reported by the U.S. Bureau of Labor Statistics. This was the most commonly used indicator of inflation. All the independent and control variables were lagged one year in the analysis, as was the common practice in the analysis of panel data (e.g., Marvell & Moody, 1996). For example, 1990 expenditures were used to predict violent crime rate taking place in 1991. Such a lag effect was presumed throughout the analysis to follow. Since cities differed in regard to their economic vitality and their demographic composition, it was important to control for these differences in the analysis presented regarding the respective effects of public investments in social control and social support on observed rates of violent crime.

Control variables

Seven control variables designed to account for differences in the socioeconomic health of the cities under review were included in the analysis. Social disorganization theory developed by Shaw and McKay provided a theoretical framework for the inclusion of these variables in this particular analysis (for a discussion and testing of social disorganization theory, see Bursik, 1988; Sampson, 1985; Sampson & Groves, 1989; Shaw & McKay, 1942; Smith & Jarjoura, 1989). Proponents of social disorganization theory argued rather convincingly that certain socioeconomic and demographic characteristics of communities were closely associated with local crime problems. Specifically, there were three primary socioeconomic dimensions that merited empirical scrutiny (Osgood & Chambers, 2000).

The first dimension included was that of *community heterogeneity*. In this study, heterogeneity was represented by the indicator, percentage of minority residents in a community. The evidence was clear that societal heterogeneity and crime tended to co-occur within American cities (Bursik, 1988; Shaw & McKay, 1942); it was clear, therefore, that this variable best be included in the analysis. *Community socioeconomic status* was included as a second important dimension, measured here by five separate variables: unemployment rate, percentage of single-parent households, percentage of young males between the ages of nineteen to twenty-four, percentage of home owners, and per capita income. Scholars have clearly documented that crime and socioeconomic deprivation tended to co-occur within American cities (Goldstein, 1990; Trojanowicz & Bucqueroux, 1990; Wilson & Kelling, 1982). Early studies by Shaw and McKay (1942) found a consistently positive relationship between economic deprivation and crime rates in American communities. In addition, Brenner (1979) observed a positive parallel relationship between unemployment and crime rates. Also, based on their longitudinal study on unemployment rates and crime rates over the period 1946 to 1982,

Cantor and Land (1985) found that there was a small but significant, total effect of the unemployment rate over five of the seven index crimes tested. More recent empirical estimates of the impact of unemployment rates on crime have been generally consistent across studies: Freeman (1995) surveyed earlier research, and more recent studies included Donohue and Levitt (2001), Gould, Weinberg, and Mustard (2002), Machin and Meghir (2000), and Raphael and Winter-Ebmer (2001). Controlling for other cross-jurisdictional difference factors, nearly all of these studies reported a statistically significant but substantively weak relationship between unemployment rates and property crime. Per capita income has long been used as a measure of poverty level, as well as an indicator of the economic health of an area in prior studies (e.g., Marvell & Moody, 2001; Worrall, 2004). A per capita measure rather than the median family income was used to adjust for differences across cities and family size (Ross & Sawhill, 1975). In order to adjust for inflation, annual CPI was used to convert the nominal dollars of per capita income from 1990 to 1999 to constant 2000 dollars. The final dimension for control variables was *community mobility* as indicated by the percentage of people having lived at the same address five years or more before the census. Since census data on this measure were available only for every decade, a measure was created to estimate the change in socioeconomic characteristics over the period 1990 to 2000. The linear interpolation was used to compute the missing values of socioeconomic variables from 1991 through 1999 (Kovandzic, Sloan, & Vieraitis, 2002; Worrall & Kovandzic, 2007).¹

There were 112 cities in 1990 that reached the population of 150,000 or more residents. Among these municipalities, some eighty-five cities had complete data for violent crime rates, annual municipal expenditures, and seven socioeconomic control variables. Data for these eighty-five cities were used for the analysis reported here.²

Statistical model specification

The pooled time-series panel data analysis technique was used to analyze the effects of city social control and social support expenditures on violent crime rate. Panel data set was one that followed a given set of subjects over time and provided multiple observations on each subject in the sample (Hsiao, 2003). Panel data models have long been considered the preferred method for the study of causation. For example, Campbell and Stanley (1967, pp. 55–57) referred to panel models as “*excellent quasi-experimental designs, perhaps the best of the more feasible designs.*” Lempert (1966, pp. 130–131) observed that panel designs were research designs “*par excellence.*” Still other researchers argued that panel techniques were essential to the causal analysis of correlation findings derived from cross-sectional studies (e.g., Hsiao, 2003; Stimson, 1985).

More specifically, a two-factor, fixed-effect panel data analysis approach was employed to evaluate the impacts of city social control and social support expenditures on violent crime rate. It allowed for unobserved systematic (nonrandom) variation to be controlled for in the analysis. The “two-factor” approach accommodated a geographic component represented by the cities in which criminal justice agencies reside, and a time-specific component represented by the eleven years of data for each of the eighty-five cities. By investigating the “first factor” (the geographic component) through the inclusion of a cross-sectional dummy variable for each city in which the agencies reside, the difference in crime rates caused by unobserved variance occurring in each city was estimated. This meant that the bias caused by any omitted variables could then be estimated, and an attempt could be made to control for extraneous effects in the panel data analyzed. Each city was allowed to have its own intercept but share the slope coefficients with the other cities (Marvell & Moody, 1995; Pindyck & Rubinfeld, 1998). Similarly, the “second factor” (the time-specific component) involved the inclusion of year dummy variables

that permitted the authors to control for those unknown factors (omitted variables) impacting crime in these large cities that were not accounted for by the other independent and socioeconomic variables. The two-factor, fixed-effect model has the following symbolic form:

$$Y_{i(t+1)} = \alpha + \beta_1 POLICE_{it} + \beta_2 JUDICIAL_{it} + \beta_3 COMM_{it} + \beta_4 P/R_{it} + \beta'x_{it} + \gamma_2 W_{2t} + \gamma_3 W_{3t} + \dots + \gamma_N W_{Nt} + \delta_2 Z_{i2} + \delta_3 Z_{i3} + \dots + \delta_T Z_{iT} + \varepsilon_{it}$$

$$\text{where } W_{it} = \begin{cases} 1 & \text{for } i\text{th city, } i = 2, \dots, N \\ 0 & \text{otherwise} \end{cases}$$

$$Z_{it} = \begin{cases} 1 & \text{for } t\text{th city, } t = 2, \dots, N \\ 0 & \text{otherwise} \end{cases}$$

where $Y_{i(t+1)}$ was the number of crime incidents per 100,000 resident for city i at year $t+1$. The symbol $\gamma_N W_{Nt}$ represented the fixed effect for city i to be estimated. The symbol $\delta_T Z_{iT}$ represented the fixed effect for year t . $POLICE_{it}$, $JUDICIAL_{it}$, $COMM_{it}$, and P/R_{it} represented the four municipal expenditure variables on police protection, court services, community development, and park and recreational facilities, measured as per resident expenditure in 1990 dollars for city i at year t . These symbols $\beta_i (i=1, 2, 3, 4)$ represented the associated coefficients to be estimated. Their values, together with the estimated standard errors, documented the extent to which conservative or liberal policies have a measurable impact on crime reduction. The symbol x_{it} represented a set of control variables (e.g., the city level unemployment rate) and the β' statistics were the associated coefficients. Finally, the symbol ε_{it} represented the error term.

The total number of variables on the right side of the equation in the analysis included the four independent variables representing the conservative and the liberal policy approaches to crime containment, seven time-varying socioeconomic (demographic) variables modeled after social disorganization theory, ten year dummy variables needed to control for variation over time, and eighty-four city dummies needed to control for geographically-based unobserved systematic variation in the panel model. All statistical diagnoses, analyses and estimations were carried out in Stata.³

Findings

Fig. 1 presents a graphic display of changes over time for the dependent variable and for the four primary independent variables. Among these eighty-five cities, violent crime rates began dropping in 1994 and crime rates reached their lowest point in 2000. More specifically, violent crime rates decreased from 1594.94 in 1993 to 945.56 in 2000, a relative decline of 40.72 percent and an absolute reduction of 649.38 per 100,000 population. While court expenditures remained nearly constant among these eighty-five cities over the 1990s period, police expenditures exhibited a steady increase over the course of the decade. Police per capita expenditure increased from \$183.46 in 1990 to \$219.73 in 2000. The trends of expenditures on social support variables (community development and park/recreational facilities) showed somewhat fluctuating patterns over time, with a slight increase in both noted after 1997. Expenditures on community development increased slightly at a fairly constant rate from 1996 to 2000.

The descriptive statistics displayed in Table 1 represent the average of eleven-year means of each variable used in the panel study analysis. The grand mean of violent crime rates in the eighty-five cities was 1,221 incidents of violent crime per 100,000 population. Overall, expenditures for police protection accounted for the highest amount of municipal spending across the four variables for city expenditures tracked over time, averaging \$201.75 per resident (in 1990 dollars) in these eighty-five cities. In comparison, city government spending on court services over this period was \$28.37 per resident. Municipal government expenditures on community development during the period were approximately \$92.00 per resident annually, and expenditures for parks and recreation programs were a little bit more at \$98.00 per resident.

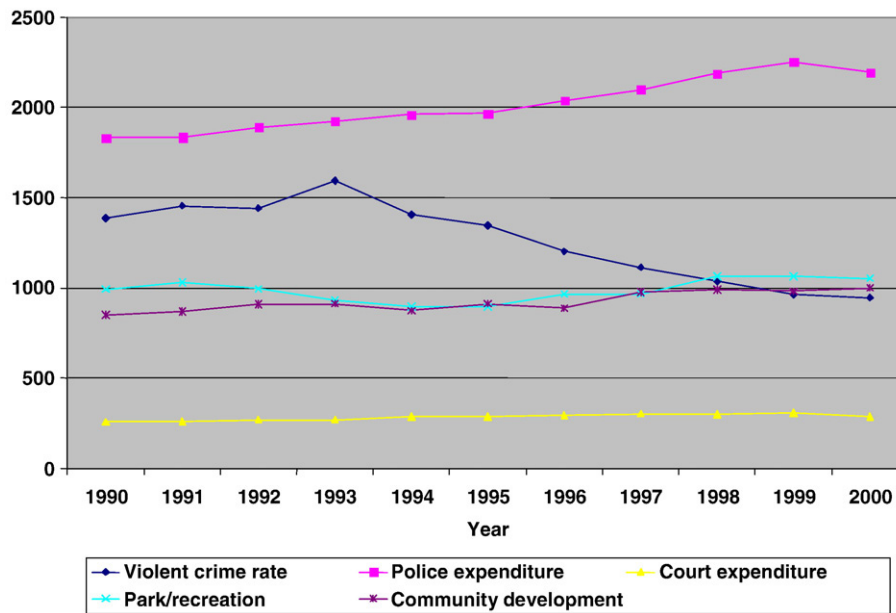


Fig. 1. Tracking violent crime rate, social control, and social support between 1990 and 2000. Note: The mean violent crime rate was the actual number per 100,000 for each year, while the values of four expenditure variables (police expenditures, court system expenditures, expenditures on community development, and expenditures on park and recreational facilities) were multiplied by 100 in order to demonstrate clear comparison between dependent variable and independent variables.

The socioeconomic and demographic variables used in the analysis were based on two waves of census data, using linear interpolation to fill in the intervening years. The demographic variables showed that 45.94 percent of the residents living in these eighty-five cities identified themselves as minority, over a third (35.51 percent) of the households in these cities can be termed single-parent households, and over half the population (51.54 percent) resided in owner-occupied dwellings. The percentage of young males (age nineteen to twenty-four) was 5.25, and the eleven-year average of unemployment in the sample was 6.09 percent. In addition, per capita income was \$19,000 on average and there was a steady increase in the 1990s period in these eighty-five cities. Finally, the percentage of residents living in the same house was 47.85.

The results derived from the multivariate analysis are reported in Table 2.⁴ The first hypothesis concerns the conservative, pro-social

control proposition that there is a direct connection between an increase in police expenditures and a corresponding decline in violent crime rate. The findings supported this proposition. The coefficient for the variable representing police expenditure suggested that an

Table 1
Descriptive statistics (explanatory variables: 1990–2000; violent crime rate: 1991–2001)

Variables	Mean	SD	Min.	Max.
<i>Dependent variable</i>				
Violent crime rate	1221.83	769.19	177.61	7323.24
<i>Independent variables</i>				
Police expenditure ^a	\$201.75	75.88	73.05	616.72
Judicial expenditure	\$28.37	38.00	.84	310.61
Comm. development expenditure	\$92.49	100.66	0	734.59
Park/recreation expenditure	\$98.76	63.74	8.55	469.38
Minority population ^b	45.94%	18.06	6.60	89.50
Single-parent households	35.51%	10.88	13.70	64.30
Young males (19–24)	5.25%	1.39	3.18	13.39
Home owners	51.55%	8.97	23.06	66.36
Unemployment rate	6.09%	2.75	1.50	17.90
Per capita income	\$19,000.12	3846.45	12152	34556
Living in the same house for five + years (residential stability)	47.85%	5.75	35.82	64.33
Number of cities=85 Number of observations=935				

^a The dollar amount of four variables, police expenditure, judicial expenditure, community expenditure, and park/recreation expenditure, were per resident in a city.
^b Minority population represented the sum of percentage of Black, percentage of Hispanic, percentage of Asian and Pacific Islander, and percentage of American Indian and Alaska Native.

Table 2
The effect of social control and social support expenditures (1990–2000) on violent crime rates (1991–2001): two-factor, fixed-effect panel model

Variables	Coefficient ^a	Robust S.E.	T value
Police expenditure	-2.06	0.53	-3.89***
Judicial expenditure	1.35	0.93	1.46
Community expenditure	-0.58	0.25	-2.33*
Park/recreation expenditure	0.47	0.26	1.77
Minority population	25.85	8.92	2.90**
Single-parent households	8.19	19.34	0.42
Young males (19–24)	84.90	47.77	1.78
Home owners	-2.72	17.65	-0.15
Unemployment rate	36.91	11.47	3.22***
Per capita income	0.03	0.02	1.30
Residential stability	29.98	17.08	1.76
Year 1991 ^b	-95.00	53.46	-1.78
Year 1992	3.88	126.90	0.03
Year 1993	-191.71	86.87	-2.21*
Year 1994	-258.16	103.80	-2.49*
Year 1995	-415.10	122.14	-3.40***
Year 1996	-523.75	144.31	-3.63***
Year 1997	-607.77	167.30	-3.63***
Year 1998	-688.21	191.20	-3.60***
Year 1999	-721.42	213.92	-3.37***
Year 2000	-777.08	234.14	-3.32***
σ_ϵ	615.06		
σ_ϵ	338.05		
ρ	.77		
Adjusted R ²	0.81		
F values=33.10***			

^a The coefficients were unstandardized.
^b Year of 1990 was the reference group. The coefficients of eighty-four city dummy variables were not reported here.
^c σ_ϵ was the panel level standard deviation. σ_ϵ was the standard deviation of ϵ (error term). ρ reflected the fraction of variance due to fixed effects.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

increase in \$1 per resident in police expenditures led to a decrease of about two violent crime incidences per 100,000 in large U.S. cities over the period 1990 to 2000. The next hypothesis predicts that an increase in court services expenditures will have a similar effect upon violent crime rate. The findings observed in this study were that there was no significant effect as hypothesized. The third hypothesis (a liberal proposition) suggests that more municipal expenditures on community development will lead to a reduction in violent crime rates. The findings derived from the panel analysis lend empirical support for this hypothesis. An increase in \$1 expenditure on community development per resident in the 1990s resulted in a decline of .58 violent crime incidents in these eighty-five cities. Finally, the hypothesis that there is a negative relationship between municipal expenditures on park/recreation and violent crime rates in a city was not supported in the analysis reported here.

In addition to the findings regarding police expenditures and community development expenditures, two demographic predictors in the model manifested significant effects. An increase in 1 percent of minority population was associated with an increase in twenty-six violent crime incidents per 100,000 residents.⁵ Of all the variables, the unemployment included in the multivariate panel data analysis demonstrated the largest effect on violent crime. The results of the statistical analysis indicated that for every 1 percent increase in city unemployment in a year, there were about thirty-seven more violent crime incidents per 100,000 population in the city experiencing an increase in unemployment. Moreover, the time-specific component represented by the year dummy variables for each of the eighty-five cities (year of 1990 was the reference group) showed negative effects on violent crime rates since 1993 and its magnitude gradually increased as time went by. This was consistent with the timing of national crime drop during the 1990s.

Overall, the R square for the multivariate prediction equation was quite high at .81. This finding indicated that about 81 percent of the variance in the dependent variable, municipal violent crime rate, was explained by the combination of predictors included in the model. An advantage of using panel data analysis was that the relationship between the dependent and independent variables was estimated both within the groups (change in one city over time) and between groups (change among cities over time). It was important to note that the independent variables and control variables explained about half of the variation in violent crime rate (R-square=38 percent), and the rest of the 43 percent of variance explained was contributed by the eleven year dummy variables and eighty-five city-specific dummy variables. Standardized coefficients were obtained to better assess the relative importance of police expenditure, community development expenditure and demographic variables (see Appendix A).

Discussion and conclusion

The debate between the conservative “social control” and the liberal “social support” ideologies captured the political center stage in 1964 when Barry Goldwater put forth crime control as a major national issue in the presidential campaign (Gest, 2001). Both conservatives and liberals have offered up their respective cures for U.S. crime problems consistently ever since. The widespread three-decade rise in crime gave both sides sufficient ammunition to pronounce the failure of the other camp’s policies (Currie, 1985; Wilson, 1975).

The intent of this study was to examine empirically prominent policy propositions proposed by the advocates of both the conservative (social control) and the liberal (social support) perspectives, using the decade of the 1990s as an empirical track record. The downward trending of the violent crime rate which occurred during the 1990s provided a good opportunity to test the basic premises of both sides of the debate. It was quite interesting that both the conservative and liberal propositions were shown to have their respective merits. More spending on law enforcement did indeed reduce crime, and more

funding for community development did indeed accomplish that goal as well among the eighty-five large U.S. cities studied.

The findings regarding the effectiveness of public investments on police as a crime reduction strategy were consistent with other recent studies using pooled time-series or panel data analysis (e.g., Levitt, 1997, 2002; Marvell & Moody, 1996; Zhao et al., 2002). The authors wish to note here that two studies using police expenditures (Levitt, 1997) and police employees (Marvell & Moody, 1996) were particularly noteworthy. Both studies collected longitudinal data for a twenty-year period ranging from the early 1970s to the early 1990s at a time when the overall trend of violent crime was climbing upward steadily. During the same period, the level of police employment was also on the rise, going from 1.70 per 1,000 residents in 1970 to 1.96 per 1,000 in 1981 (Bureau of Justice Statistics, 1986), representing a 17 percent increase. Seemingly, the bivariate relationship between police resources and crime was a positive one.

The pooled time-series panel data analysis had several advantages over more commonly used time-series or cross-sectional designs, including providing for a very large sample size. The large sample size attainable allowed the researcher to enter numerous control variables and still retained a large number of degrees of freedom. For each city, the other cities acted as controls; this allowed the researcher to enter proxy variables for unknown factors (i.e., omitted control variables) that might cause the dependent variables to vary over time and over cities (Marvell & Moody, 1995, p. 257). Given these analytical tools, the pooled time-series panel data analysis enabled researchers to present a much more accurate and more well-informed assessment of the true relationship between the level of police resources and crime rates. Though the within-group examination on each individual city over multiple years (e.g., 1973 to 1993) might find a simultaneous increase in both police expenditure and crime, the analysis of between groups (among cities over multiple years) allowed the isolation of effects attributable to differential rates of police resource investment. When the change in additional police expenditure was greater than the change in crime rate in some cities than the others, the association between police resources investment and crime could still lead to evidence of negative association if such an effect was present. Cross-sectional analysis of multiple cities or time-series analysis of one city alone cannot lead to the detection of connections between police resources and crime rates (for a detailed discussion see Hsiao, 2003).

It was also important to note that expenditure on community development as a form of public investment in social support also demonstrated a significant effect on crime reduction in large U.S. cities. Empirical studies found that lack of social support in a community led to social disorder, and that increased disorder could cause a spiral downward trend as Skogan revealed in his longitudinal study of six U.S. cities in the 1980s (Skogan, 1990; Skogan & Maxfield, 1981). In addition, lack of economic development also impeded social integration and collective efficacy at both the community and the neighborhood level (e.g., McGarrell, Giacomazzi, & Thurman, 1997; Morenoff, Sampson, & Raudenbush, 2001; Sampson & Groves, 1989; Sampson et al., 1997). In addition, a recent comparative study of three cities revealed that lack of social integration and collective efficacy resulted in a noteworthy increase in fear of crime among community residents (Gibson, Zhao, Lovrich, & Gaffney, 2002). In sum, there was a rich body of literature in the discipline that documented a strong relationship between level of community development and social disorder and crime phenomena.

It was worthwhile to note that two control variables derived from social disorganization theory—namely, unemployment rate and percentage of minority population—showed the strongest effect on crime rate among these eighty-five cities. The findings were consistent with the empirical studies testing social disorganization theory, indicating the strong effects of community demographics on crime (Osgood & Chambers, 2000; Sampson, 1985; Sampson & Groves, 1989; Shaw &

McKay, 1942; Smith & Jarjoura, 1989). Particularly noteworthy was the observation that an increase in 1 percent of unemployment occasioned thirty-eight violent crime incidences per 100,000 population after controlling for the influence of all other factors in eighty-five cities over the period 1990 to 2000. This finding was consistent with a positive parallel relationship between unemployment and crime rates derived from previous literature on this subject. This finding indirectly supported the liberal perspective prescription that improvements in socioeconomic infrastructure such as creation of employment opportunities for the most disadvantaged members of the workforce were highly beneficial to crime control in a community.

Finally, the findings reported here suggested that an effective public policy on crime control should combine the merits of both the conservative and the liberal perspectives on crime. Both the world of practice and the competing theoretical frameworks of the academic world offered evidence of the effectiveness of policies derived from both conservative and liberal perspectives. At the level of practice, a number of programs and policies operating in the 1990s seemed to embody this characteristic of combined social control and social support objectives. In the area of policing, the implementation of the Weed and Seed Program was perhaps a good example of such a program (Office of Justice Program, 1999). At the first stage of anti-crime intervention, police officers aggressively pursued criminal suspects and made arrests in targeted neighborhoods (the weed part). Once this phase of the intervention was completed, the emphasis of the program shifted to community rebuilding, including the economic revitalization of the neighborhood's commercial and residential infrastructure; efforts were made to reestablish mutual trust among local residents and area businesses (the seed part). A major national evaluation of program outcomes in eight major cities found that the program was quite effective in reducing crime and in accomplishing lasting community improvement. For example, the evaluation study documented evidence that targeted neighborhoods in five cities showed double-digit percentage crime reductions one year after implementation (Office of Justice Program, 1999).

At the theoretical level, in his new book, *The Culture of Control*, Garland (2001) presented a complex argument about developments in crime control and criminal justice in the U.S. and Britain during the past half century. He suggested that recent crime control initiatives on both sides of the Atlantic represented a "reconfigured complex of interlocking structures and strategies that are themselves composed of old and new elements, the old revised and reoriented by a new context" (p. 23). More specifically, because of the prevalence of high crime rates and disorder and the recognition that the forces of the criminal justice system possess limited ability to control crime and ensure security, the penal-welfarism system of the pre-1970s period abdicated to the new culture of control. In response to this evolving environment, actors developed new strategies that appealed to political, popular, and professional sectors. The rise of the culture of control corresponded to a new market-oriented style of decision-making, a new criminology of control, and a new conception of a penal-welfarism. Garland suggested that contemporary justice policy is "bifurcated," reflecting a composite of an *adaptive strategy* characterized by community partnerships and a *sovereign state strategy* that stresses the use of coercive control over offenders. The findings of this study seemed to parallel those of Garland's with respect to the bifurcated nature of U.S. control policies.

In closing, some limitations of this study need to be addressed. First, the authors did not examine the relationship between the expansion of jail and prison resources and the fluctuation in crime rates in these eighty-five cities. Incarceration capacity information was not readily available at the city level at this time, hence the lack of consideration of this phenomenon in this particular analysis. Second, crime trend data were not available for all large U.S. cities; it was possible that the non-reporting cities were systematically different

from those that report to the UCR system. Finally, it will be necessary to replicate this study in a few years to determine if the effects of the social control and social support variables remain similar to those documented for the period of the 1990s.

Appendix A. Standardized coefficients of violent crime rate model

Variables	Standardized coefficient	Robust S.E.
Police expenditure	-0.20***	0.05
Judicial expenditure	0.07	0.05
Community expenditure	-0.08**	0.03
Park/recreation expenditure	0.04	0.02
Minority population	0.61**	0.21
Single-parent households	0.12	0.27
Young males (19-24)	0.15	0.09
Home owners	-0.03	0.21
Unemployment rate	0.13***	0.04
Per capita income	0.14	0.10
Residential stability	0.22	0.13
Year 1991	-0.12	0.07
Year 1992	0.01	0.16
Year 1993	-0.25*	0.11
Year 1994	-0.34*	0.13
Year 1995	-0.54***	0.16
Year 1996	-0.68***	0.19
Year 1997	-0.79***	0.22
Year 1998	-0.89***	0.25
Year 1999	-0.94***	0.28
Year 2000	-1.01***	0.30

* p < .05.
 ** p < .01.
 *** p < .001.

Appendix B. The effect of social control and social support expenditures (1990-2000) on property crime rates (1991-2001): two-factor, fixed-effect panel model

Variables	Coefficient ^a	Robust S.E.	T value
Police expenditure	-3.44	1.18	-2.91**
Judicial expenditure	6.36	1.64	3.88***
Community expenditure	-0.60	0.58	-1.09
Park/recreation expenditure	0.87	0.66	1.31
Minority population	40.05	22.26	1.80
Single-parent households	188.35	36.86	5.11***
Young males (19-24)	400.24	140.72	2.84**
Home owners	34.32	47.73	0.72
Unemployment rate	108.96	34.32	3.17**
Per capita income	0.19	0.06	3.29***
Residential stability	4.57	37.41	0.12
Year 1991 ^b	-832.44	167.03	-4.98***
Year 1992	-1365.94	204.90	-6.67***
Year 1993	-1801.86	230.85	-7.81***
Year 1994	-2049.23	257.60	-7.91***
Year 1995	-2582.79	297.44	-8.68***
Year 1996	-3181.69	341.19	-9.33***
Year 1997	-3694.07	390.76	-9.45***
Year 1998	-4302.37	434.77	-9.90***
Year 1999	-4639.77	484.45	-9.58***
Year 2000	-4811.86	537.12	-8.96***
σ_{α}^c	2202.71		
σ_{ϵ}	749.95		
ρ	0.90		
Adjusted R ²	0.89		
F values = 64.57***			

^a The coefficients were unstandardized.
^b Year of 1990 was the reference group. The coefficients of eighty-four city dummy variables were not reported here.
^c σ_{α} was the panel level standard deviation. σ_{ϵ} was the standard deviation of ϵ (error term). ρ reflected the fraction of variance due to fixed effects.
 * p < .05.
 ** p < .01.
 *** p < .001.

Appendix C. The effect of social control and social support expenditures (1990–2000) on violent crime rates (1991–2001): percentage of minority population was broken down into three racial/ethnic groups

Variables	Coefficient ^a	Robust S.E.	T value
Police expenditure	-2.08	0.51	-4.09***
Judicial expenditure	1.13	0.99	1.14
Community expenditure	-0.61	0.24	-2.54**
Park/recreation expenditure	0.50	0.32	1.55
African American population ^b	43.54	14.24	3.06**
Hispanic population	20.44	11.14	1.83
Other racial/ethnic groups ^c	21.22	14.83	1.43
Single-parent households	-7.15	20.34	-0.35
Young males (19–24)	76.48	60.42	1.27
Home owners	-0.11	22.20	-0.01
Unemployment rate	36.19	13.68	2.65**
Per capita income	0.02	0.03	0.71
Residential stability	31.19	14.84	1.68
Year 1991 ^d	-76.05	59.86	-1.27
Year 1992	42.00	77.67	0.54
Year 1993	-135.59	96.07	-1.41
Year 1994	-184.03	118.31	-1.56
Year 1995	-323.13	142.70	-2.26*
Year 1996	-413.86	167.61	-2.47**
Year 1997	-479.50	193.74	-2.48**
Year 1998	-542.27	219.69	-2.47**
Year 1999	-557.30	246.15	-2.26*
Year 2000	-599.40	237.25	-2.19*
σ_{ϵ}	635.84		
σ_{ϵ}	337.86		
ρ	.78		
Adjusted R ²	0.81		
F values=21.00***			

^a The coefficients were unstandardized.

^b Percentage of Whites was the reference group.

^c Percentage of other racial/ethnic groups included percentage of Asian and Pacific Islander, American Indian, and Alaska Native.

^d Year of 1990 was the reference group. The coefficients of eighty-four city dummy variables were not reported here.

^e σ_{ϵ} was the panel level standard deviation. σ_{ϵ} was the standard deviation of ϵ (error term). ρ reflected the fraction of variance due to fixed effects.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Notes

1. Time-varying variables can be defined as variables that have annual observations during the period of study (e.g., the annual change in government expenditures or percentage of workforce unemployed during the period 1990 to 2000).

2. The reviewer correctly pointed out that incarceration rates might affect the violent crime rates. Unfortunately, the data were not available at the city level. The authors acknowledged this as one of the limitations of this study. In fact, based on the model specification, a two-factor, fixed-effect panel data analysis allows for unobserved systematic (nonrandom) variation to be controlled for in the analysis. By using "two-factor" (the geographic component and the time-specific component), the bias caused by any omitted variables can then be controlled and estimated. More specifically, the effects of omitted variables such as incarceration rates might have been explained by the year dummy variables and city dummy variables included in the model.

3. Autocorrelation is the correlation of a variable with itself over successive time intervals. The most common situation in which this occurs is in time series regression in which the observation consists of a single individual or unit at multiple points in time (Berry & Feldman, 1985). The frequently used Durbin-Watson statistic is not adequate for panel data regression. Wooldridge (2002, pp. 282–283) derived a test for autocorrelation in panel data models. Drukker (2003) provided simulation results showing that the test has good size and power properties in reasonable sized samples. Stata offered the commands to perform the Wooldridge test for autocorrelation. The test was run and the nonsignificant test statistics indicated the absence of autocorrelation. To detect whether heteroscedasticity existed or not, graphical examinations of residuals were conducted. A set of scatterplots was generated plotting the residuals against each of the independent variables and the predicted values (Cohen, Cohen, West, & Aiken, 2003). No specific patterns materialized; hence heteroscedasticity was not a problem in the study. To test for multicollinearity, variance inflation factors (VIF) were computed for each independent variable in the model. The VIF were well below a score of 4, which indicated that multicollinearity was not present (Fisher & Mason, 1981; Judge, Hill, Griffiths, Lutkepohl, & Lee, 1988).

4. Results of the panel model for property crime rates are reported in Appendix B. Although the primary focus of this study was on the street violent crime as discussed in the article, property crime rates were part of the crime statistics and police expenditure was inevitably related to the change in property crime rates. Thus, a separate model for property crime rates was run by using the same statistical approach. The findings suggested that the impact of police expenditure on property crimes remained significant. It was important to note that regression residuals were tested for autocorrelation using the Wooldridge test (Wooldridge, 2002). The significant test statistics indicated the presence of autocorrelation, which meant that the disturbance term was first order autoregressive. Therefore, adjustment commands provided by Stata were adopted to address the issue in the current model. The transformed data were considered free from serial correlation.

5. In order to demonstrate the specific impact of each minority group on violent crime rates, the variable of minority population was broken down into three categories—African American, Hispanic, other racial/ethnic groups including Asian and Pacific Islander, American Indian, and Alaska native. While the percentage of Whites was employed as the reference group, these three categories were included in the panel analysis. The findings are reported in Appendix C.

References

- Becker, G. S. (1968). Crime and punishment: An economic approach. *Journal of Political Economy*, 76, 169–217.
- Berry, W. D., & Feldman, S. (1985). *Multiple regression in practice*. Beverly Hills, CA: Sage.
- Blau, J. R., & Blau, P. M. (1982). The cost of inequality: Metropolitan structures and violent crimes. *American Sociological Review*, 83, 114–129.
- Brenner, M. H. (1979). *Estimating the social costs of national economic policy: Implications for mental and physical health and criminal aggression* (Study prepared for the Joint Economic Committee of Congress). Washington, DC: U.S. Government Printing Office.
- Bureau of Justice Statistics. (1986). *Police employment and expenditure trends*. Washington, DC: U.S. Department of Justice.
- Bursik, R. (1988). Social disorganization and theory of crime and delinquency: Problems and prospects. *Criminology*, 26, 519–551.
- Campbell, D. T., & Stanley, J. C. (1967). *Experimental and quasi-experimental designs for research*. Chicago: Rand, McNally.
- Cantor, D., & Land, K. C. (1985). Unemployment and crime rates in the post-World War II United States: A theoretical and empirical analysis. *American Sociological Review*, 50, 317–332.
- Cao, L., Cao, J., & Zhao, J. (2004). Family, welfare and delinquency. *Journal of Criminal Justice*, 32, 565–576.
- Clark, R. (1970). *Crime in America*. New York: Free Press.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Lawrence Erlbaum.
- Cullen, F. T. (1994). Social support as an organizing concept for criminology. *Justice Quarterly*, 11, 527–559.
- Currie, E. (1985). *Confronting crime: An American challenge*. New York: Pantheon Books.
- Dilulio, J. (1991). *No escape: The future of American corrections*. New York: Basic Books.
- Donohue, J., & Levitt, S. D. (2001). The impact of legalized abortion on crime. *Quarterly Journal of Economics*, 116, 379–420.
- Drukker, D. M. (2003). Testing for serial correlation in linear panel-data models. *Stata Journal*, 3, 168–177.
- Duffee, D. (1980). *Explaining criminal justice: Community theory and criminal justice reform*. Prospect Heights, IL: Waveland Press.
- Eck, J., & Maguire, E. (2000). Have changes in policing reducing violent crime? An assessment of the evidence. In A. Blumstein & J. Wallman (Eds.), *The crime drop in America* (pp. 207–265). New York: Cambridge University Press.
- Fisher, J. C., & Mason, R. L. (1981). The analysis of multicollinear data in criminology. In J. A. Fox (Ed.), *Methods in quantitative criminology* (pp. 99–125). New York: Academic Press.
- Freeman, R. (1995). The labor market. In J. Q. Wilson & J. Petersilia (Eds.), *Crime*. San Francisco: Institute for Contemporary Studies.
- Garland, D. (2001). *The culture of control: Crime and social order in contemporary society*. Chicago: University of Chicago Press.
- General Accounting Office. (2005). *Interim report on the effects of COPS funds on the decline in crime during the 1990s*. Washington, DC: U.S. Government Printing Office.
- Gest, T. (2001). *Crime and politics*. New York: Oxford University Press.
- Gibbons, D. C., & Garabedian, P. (1974). Conservative, liberal, and radical criminology: Some trends and observations. In C. E. Reardon (Ed.), *The criminologist: Crime and the criminals* (pp. 51–65). Pacific Palisades, CA: Goodyear.
- Gibson, C. L., Zhao, J., Lovrich, N. P., & Gaffney, M. J. (2002). Social integration, individual perceptions of collective efficacy, and fear of crime in three cities. *Justice Quarterly*, 19, 537–563.
- Goldstein, H. (1990). *Problem-oriented policing*. Philadelphia: Temple University Press.
- Gould, E., Weinberg, B. A., & Mustard, D. B. (2002). Crime rates and local labor market opportunities in the United States: 1979–1997. *Review of Economics and Statistics*, 84, 45–61.
- Greenberg, D. F., & Kessler, R. C. (1982). Model specification in dynamic analyses of crime deterrence. In J. Hagan (Ed.), *Deterrence reconsidered: Methodological innovations* (pp. 15–32). Beverly Hills, CA: Sage.
- Hoover, L. T. (2005). From police administration to police science: The development of a police academic establishment in the United States. *Police Quarterly*, 8, 8–22.
- Howsen, R. M., & Jarrell, S. B. (1987). Some determinants of property crime: Economic factors influence criminal behavior but cannot completely explain the syndrome. *American Journal of Economics and Sociology*, 46, 445–457.
- Hsiao, C. (2003). *Analysis of panel data*. New York: Cambridge University Press.
- Judge, G., Hill, R. C., Griffiths, W. E., Lutkepohl, H., & Lee, T. C. (1988). *Introduction to the theory and practice of econometrics* (2nd ed.). New York: John Wiley.

- Kerner Commission. (1968). *Report on the National Advisory Commission on Civil Disorders*. Washington, DC: U.S. Government Printing Office.
- Kovandzic, T., Sloan, J., & Vieraitis, L. (2002). Unintended consequences of politically popular sentencing policy: The homicide promoting effects of "three strikes" in U.S. cities (1980–1990). *Criminology and Public Policy*, 1, 399–424.
- Land, K. C., & Felson, M. (1976). A general framework for building dynamic macro social indicator models: Including an analysis of changes in crime rates and police expenditure. *American Journal of Sociology*, 82, 565–604.
- Lempert, R. (1966). Strategies of research design in the legal impact study: The control of plausible rival hypotheses. *Law and Society Review*, 1, 111–132.
- Levitt, S. D. (1997). Using electoral cycles in police hiring to estimate the effect of police on crime. *American Economic Review*, 47, 393–401.
- Levitt, S. D. (2002). Using electoral cycles in police hiring to estimate the effects of police on crime: Reply. *American Economic Review*, 92, 1244–1250.
- Levitt, S. D. (2004). Understanding why crime fell in the 1990s: Four factors that explain the decline and six that do not. *Journal of Economic Perspectives*, 18, 163–190.
- Lin, N. (1986). Conceptualizing social support. In N. Lin, A. Dean, & W. Edsel (Eds.), *Social support, life events, and depression*. Orlando, FL: Academic Press.
- Machin, S., & Meghir, C. (2000). Crime and economic incentives. Unpublished manuscript.
- Marvell, T., & Moody, C. (1995). The impact of enhanced prison terms for felonies committed with guns. *Criminology*, 33, 247–282.
- Marvell, T., & Moody, C. (1996). Specification problems, police levels, and crime rates. *Criminology*, 34, 609–646.
- Marvell, T., & Moody, C. (2001). The lethal effects of three-strikes laws. *Journal of Legal Studies*, 30, 89–106.
- McGarrell, E. F., Giacomazzi, A. L., & Thurman, Q. C. (1997). Neighborhood disorder, integration, and the fear of crime. *Justice Quarterly*, 14, 479–499.
- Miller, W. B. (1973). Ideology and criminal justice policy: Some current issues. *Journal of Criminal Law and Criminology*, 64, 141–162.
- Morenoff, J. D., Sampson, R. S., & Raudenbush, S. W. (2001). Neighborhood inequality, collective efficacy, and the spatial dynamics of urban violence. *Criminology*, 39, 517–560.
- Office of Justice Program. (1999). *National evaluation of Weed and Seed: Cross-site analysis*. Washington, DC: National Institute of Justice.
- Ohlin, L. D. (1971). The effect of social change on crime and law enforcement. In L. W. Levy (Ed.), *Perspectives on the report of the President's Commission on Law Enforcement and the Administration of Justice*. New York: Da Capo Press.
- Osgood, D., & Chambers, J. (2000). Social disorganization outside the metropolis: An analysis of rural youth violence. *Criminology*, 38, 81–115.
- Packer, H. (1968). *The limits of the criminal sanctions*. Stanford, CA: Stanford University Press.
- Pindyck, R. S., & Rubinfeld, D. L. (1998). *Econometric models and economic forecasts*. New York: McGraw-Hill/Irwin.
- Pogue, T. F. (1975). Effect of public expenditures on crime rates: Some evidence. *Public Finance Quarterly*, 3, 14–44.
- Pratt, T. C., & Godsey, T. W. (2003). Social support, inequality, and homicide: A cross-national test of an integrated theoretical model. *Criminology*, 41, 611–643.
- Raphael, S., & Winter-Ebmer, R. (2001). Identifying the effect of unemployment on crime. *Journal of Law and Economics*, 44, 259–284.
- Rosch, J. (1985). Crime as an issue in American politics. In E. S. Fairchild & V.J. Webb (Eds.), *The politics of crime and criminal justice*. Beverly Hills, CA: Sage.
- Ross, H., & Sawhill, I. (1975). *Time of transition: The growth of families headed by women*. Washington, DC: Urban Institute.
- Sampson, R. (1985). Neighborhood and crime: The structural determinants of personal victimization. *Journal of Research in Crime and Delinquency*, 22, 7–40.
- Sampson, R., & Groves, W. (1989). Community structure and crime: Testing social disorganization theory. *American Journal of Sociology*, 94, 774–802.
- Sampson, R., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study on collective efficacy. *Science*, 277, 914–924.
- Scheingold, S. A. (1984). *The politics of law and order*. New York: Longman.
- Shaw, C., & McKay, H. (1942). *Juvenile delinquency and urban areas*. Chicago: University of Chicago Press.
- Skogan, W. G. (1990). *Disorder and decline: Crime and the spiral of decay in American neighborhoods*. New York: Free Press.
- Skogan, W. G., & Maxfield, M. G. (1981). *Coping with crime: Individual and neighborhood differences*. Beverly Hills, CA: Sage.
- Smith, D., & Jarjoura, R. (1989). Social structure and criminal victimization. *Journal of Research in Crime and Delinquency*, 25, 27–52.
- Stimson, J. (1985). Regression in space and time: A statistical essay. *American Journal of Political Science*, 29, 914–947.
- Swimmer, E. (1974). Relationship of police and crime: Some methodological and empirical results. *Criminology*, 12, 293–314.
- Trojanowicz, R., & Bucqueroux, B. (1990). *Community policing: A contemporary perspective*. Cincinnati, OH: Anderson.
- U.S. Census Bureau. (2000). *Federal, state, and local governments: Government finance and employment classification manual*. Retrieved August 3, 2007, from <http://www.census.gov/govs/www/class.html>
- Van den Haag, E. (1975). *Punishing criminals: Concerning a very old and painful question*. New York: Basic.
- Van den Haag, E. (1982). Punishment as a device for controlling the crime rate. In F. Elliston & N. Bowie (Eds.), *Ethics, public policy and criminal justice* (pp. 195–218). Cambridge, MA: Oelgeschlager, Gunn and Hain.
- Walker, S. (1985). *Sense and nonsense about crime: A policy guide*. Monterey, CA: Brooks/Cole.
- Wellford, C. R. (1974). Crime and police: A multivariate analysis. *Criminology*, 12, 195–213.
- Wilson, J. Q. (1975). *Thinking about crime*. New York: Random House.
- Wilson, J. Q., & Kelling, G. (1982, March). Broken windows: The police and neighborhood safety. *The Atlantic Monthly*, 29–37.
- Wooldridge, J. M. (2002). *Econometric analysis of cross section and panel data*. Cambridge, MA: MIT Press.
- Worrall, J. L. (2004). The effect of three-strikes legislation on serious crime in California. *Journal of Criminal Justice*, 32, 283–296.
- Worrall, J. L., & Kovandzic, T. V. (2007). COPS grants and crime revisited. *Criminology*, 45, 159–190.
- Zhao, J., Scheider, M., & Thurman, Q. (2002). Community policing and crime: A national assessment of the effects of COPS grants on crime. *Criminology and Public Policy*, 2, 7–32.